

## REMARKS

### **I. Current Status of the Application**

Claims 15, 16, and 18 – 28 are currently pending in the present application. Claim 15 is the sole independent claim. Claim 15 has been amended. Support for this amendment may be found in at least paragraphs [0026] – [0027] of the application as published.

Claims 15 and 22 – 26 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over U.S. Patent No. 4,741,978 (“Takabayashi”) in view of European Patent No. EP 1 235 340 (“Takatoshi”), U.S. Patent No. 4,968,338 (“Sugiyama”), U.S. Patent Application Publication No. 2001/0026429 (“Fukuda”), and U.S. Patent No. 5,589,743 (“King”). Claims 16, 18, 20, 21, and 27 also stand rejected under § 103 as allegedly being unpatentable over the combination of Takabayashi, Takatoshi, Sugiyama, Fukuda, and King, and further in view of U.S. Patent Application Publication No. 2002/0094467 (“Nonobe”). Further, claim 19 is rejected under § 103 as allegedly being unpatentable over the combination of Takabayashi, Takatoshi, Sugiyama, Fukuda, King, and Nonobe, and further in view of U.S. Patent No. 6,463,949 (“Ferguson”) and, alternatively in view of Ferguson and U.S. Patent No. 7,279,242 (“Sugawara”).

Claim 28 stands objected to but is designated as allowable subject matter. The Office Action did not raise any issues with the drawings or the specification.

The Applicant respectfully requests reconsideration of these rejections in view of the foregoing amendments and the following remarks.

### **II. Applicant’s Statement of Substance of Interview**

In compliance with M.P.E.P. § 713.04, the Applicant provides this Statement of Substance of Interview concerning the personal interview conducted on December 7, 2010, between Examiner Christopher Bobish, Supervisory Patent Examiner Devon Kramer, and Applicant’s representative, Bryan Nese.

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|-----|-------------------|---|
| (A) | <u>Exhibits.</u>  | No exhibit was shown. No demonstration was conducted. |
| (B) | <u>Claim.</u>     | Claim 15 was discussed.                               |
| (C) | <u>Prior art.</u> | Sugiyama, King  |

(D) Amendments. Those presented above.

(E) Principal Arguments. Applicant's representative described various novel features of the inventions recited by claim 15. The Examiners agreed that the counting of several different types of abnormality determinations by various means and included in a single "count" was not taught by any of the cited references. The Examiners suggested amending the independent claim to recite that the plurality of different types of abnormalities are detected by a plurality of sensors at a plurality of different locations. The Examiners indicated that this would put claim 15 in allowable condition.

(F) Other matters. N/A.

(G) Results. Agreement was reached that the above amendments distinguish over the art of record.

### **III. Remarks Regarding the Use of Sugawara as Prior Art**

As a preliminary matter, the Applicant respectfully submits that Sugawara is not valid prior art under 35 U.S.C. § 102. While Sugawara's filing date is October 23, 2003, the present application's earliest priority date is November 1, 2002. Although Sugawara claims priority to a Japanese application filed on October 23, 2002, this does not affect its prior art date under § 102.

Thus, Sugawara is not valid prior art. Accordingly, the Applicant respectfully requests withdrawal of all rejections relying on this reference.

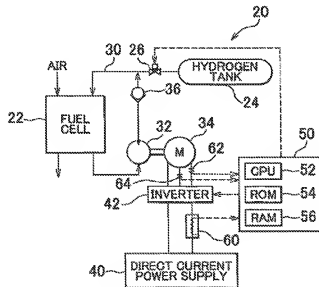
### **IV. Remarks Regarding the § 103 Rejection**

Claim 15, the sole independent claim, stands rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Takabayashi in view of Takatoshi, Sugiyama, Fukuda, and King.

The Applicant respectfully submits that claim 15 is patentable over the cited references at least because it recites, in part, "an abnormality detecting portion which detects a plurality of types of different abnormalities related to currents driving the motor *using a plurality of sensors at a plurality of different locations*" (emphasis added).

Each of Takabayashi, Takatoshi, Sugiyama, Fukuda, and King fail to teach keeping a common count of detected abnormalities determined by a plurality of sensors located through the system, as recited by claim 15. Nevertheless, the Office Action asserts that the combination of Takabayashi, Takatoshi, Sugiyama, Fukuda, and King renders claim 15 of the present application unpatentable.

One example of a device in accordance with claim 15 of the present application is shown in Figure A below. This example includes a fuel cell power source (22) that is supplied with hydrogen fuel from a fuel tank (24) through a circulation path (30). In order to recapture unused hydrogen, this example further includes a pump (32) in the circulation path (30), the pump being controlled by a motor (34). This example also includes an electronic control unit (ECU 50) that controls the system, current sensors (62, 64), and an intelligent power module (IPM) sensor (60).



**Figure A: FIG. 1 of the Present Application**

The above system also features an ability to determine when an abnormality occurs in the fuel supply and circulation system, such as a check valve (36) freezing shut. This system makes this determination based on inputs from sensors (60, 62, and 64). If the output from these sensors indicates an abnormality, a "count" variable in the ECU is increased. Once the count variable reaches a predetermined value, the system determines that an abnormality has occurred.

In this way, any erroneous abnormality detections caused by noise are not misread as an actual abnormality.

In order to determine that an abnormality has occurred quickly, the count variable acts as a total abnormality count. In other words, separate counts are not made for the various types of abnormalities the system may detect; instead, they are all rolled into a single count. For example, all detected abnormalities increase the same count variable, regardless of whether the detected abnormality is an over current, lock, or IMP abnormality. This results in an improvement over typical abnormality determination systems, which make a final abnormality determination only after a specified number of abnormalities of one type reaches a predetermined number. It is this feature, hereafter referred to as “common counting,” that sets the above example apart from the cited references.

Takabayashi, Takatoshi, and Fukuda (and the deficiencies of each) were discussed at length in previous responses. For example, Takabayashi does not teach or suggest a detection section that detects abnormalities related to driving the motor.

King also fails to make up for the deficiencies of Takabayashi, Takatoshi, and Fukuda. King at best teaches the use of current sensors for “providing overcurrent protection” for an inverter. (King at col. 3, ll. 39 – 42.) King says nothing of detecting overcurrent abnormalities after an inverter section, as recited by claim 15. Further, King fails to teach keeping a common count of various types of abnormalities. Indeed, King is silent on keeping a count of any sort of abnormality.

Regarding Sugiyama, the Applicant submits that this reference at best teaches counting a *single type of abnormality*: a detection of over current entering an inverter. When the count for any single type of abnormality reaches a predetermined limit, the system determines that an error has occurred. Because it only discloses a single count variable and a single type of abnormality, this reference fails to teach the common counting feature as described above.

Although the Office Action argues that this reference teaches a detecting portion that “counts up an inclusive number of the plurality of types of detected abnormalities (via 12a), regardless of type” (Office Action at 3), nothing in Sugiyama itself suggests this to be the case. Rather, Sugiyama merely describes a “counter 12a as a counting mean for counting the number of inputs of the over current detection signal.” (Sugiyama at col. 5, ll. 9 – 11). The Office

Action does not indicate how Sugiyama teaches this feature. Instead, the Office Action references a portion of columns 5 and 6 of Sugiyama. A review of this portion, however, reveals that it at best teaches counting only a single type of abnormality and making a determination once the count reaches a certain value. Therefore, Sugiyama fails to teach counting up an inclusive number of abnormalities, regardless of their type, as recited by claim 15 of the present application.

An example illustrating this distinction is instruction. Under the teachings of Sugiyama, if abnormalities A, B, and C each occur once, the system would still register a “count” of 1. Thus, if the predetermined limit was 3, a system based on Sugiyama would not determine that an error has occurred. In contrast, if a system in accordance with the present application’s claim 15 were to be under the same scenario (each of A, B, and C occurring once), this system would register a count of 3. Thus, this system, under the same set of circumstances, would determine that an error has occurred.

Additionally, none of the other references of record make up for the deficiencies of Takabayashi, Takatoshi, Sugiyama, Fukuda, and King. For example, Nonobe fails to teach the use of a motor to power the pump and therefore would have no need for the abnormality determination procedure described above. Also, Ferguson at best describes determining whether a valve has failed by comparing an expected fluid characteristic to a measured fluid characteristic. Ferguson is silent on keeping a common count of a plurality of types of abnormality detections in making an abnormality determination.

Therefore, in order to advance prosecution, the Applicant has amended claim 15 to highlight these distinctions. Specifically, claim 15 has been amended to specify that the abnormalities are detected based on the output of a plurality of sensors located throughout the system. Support for this amendment may be found in at least paragraphs [0026] – [0027] of the application as published.

For at least these reasons, the cited references (individually and in combination) fail to teach every feature of the present application’s independent claim. Specifically, each of Takabayashi, Takatoshi, Sugiyama, Fukuda, and King fail to teach keeping a common count of detected abnormalities as determined based on the output of a plurality of sensors located

throughout the system, as recited by claim 15. Accordingly, the Applicant respectfully requests withdrawal of the § 103 rejection of claim 15 and all claims depending therefrom.

**CONCLUSION**

In light of the above discussion, the Applicant respectfully submits that the present application is in all aspects in allowable condition, and earnestly solicits favorable reconsideration and early issuance of a Notice of Allowance.

The Examiner is invited to contact the undersigned at (202) 220-4420 to discuss any matter concerning this application. The Office is authorized to charge any fees related to this communication to Deposit Account No. 11-0600.

Respectfully submitted,

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